Physics of Atomic Nuclei 1997 vol.60 N5, pages 841-847

Generalized interaction operator and new class of models in nonrelativistic quantum scattering theory

Gainutdinov R., Moutygoullina A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The method developed by one of the present authors [Gainutdinov, R. Kh., Yad. Fiz., 1983, vol. 37, p. 464; 1987, vol. 46, p. 1271; 1991, vol. 53, p. 1431] for constructing the S matrix is used to study the possibility of generalizing conventional nonrelativistic quantum scattering theory. The concept of a nonrelativistic generalized interaction operator is introduced. In a particular case, this operator can be chosen in such a way that the resulting theory proves equivalent to standard formal scattering theory. It is shown that generalizations to a wider class of these operators are possible. The physical significance of models that can be constructed in this way is considered. It is shown that these models open new possibilities for describing low-energy hadron-hadron interactions.